Jan. 9, 1945. R. L. BARRY 2,367,086

MEANS FOR TAPING ARMATURE COILS

Filed May 1, 1943 2 Sheets-Sheet 1

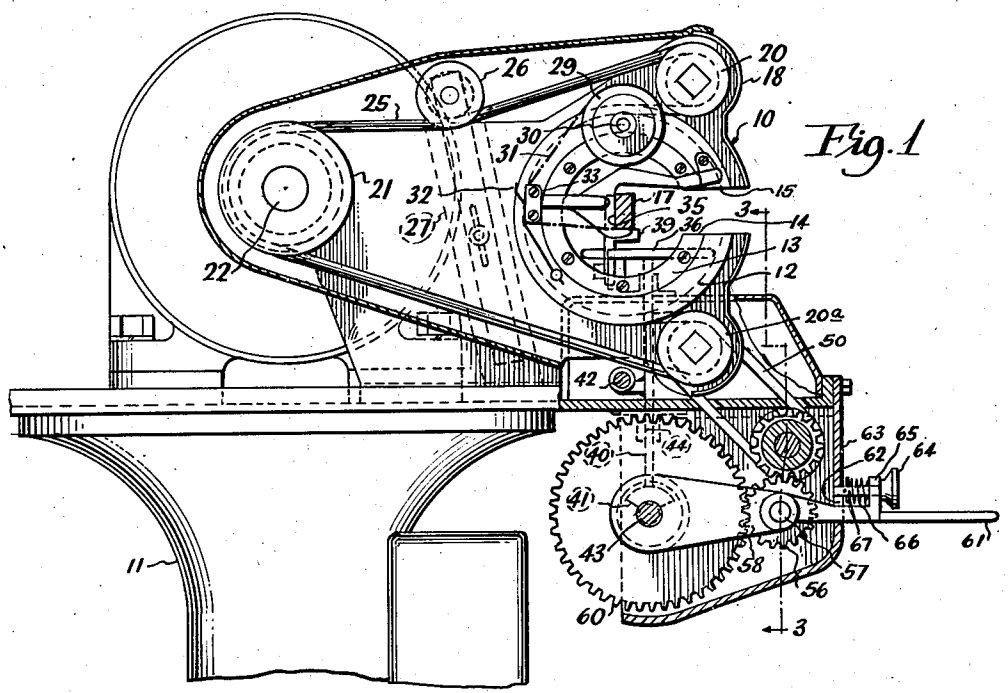


Fig. 1

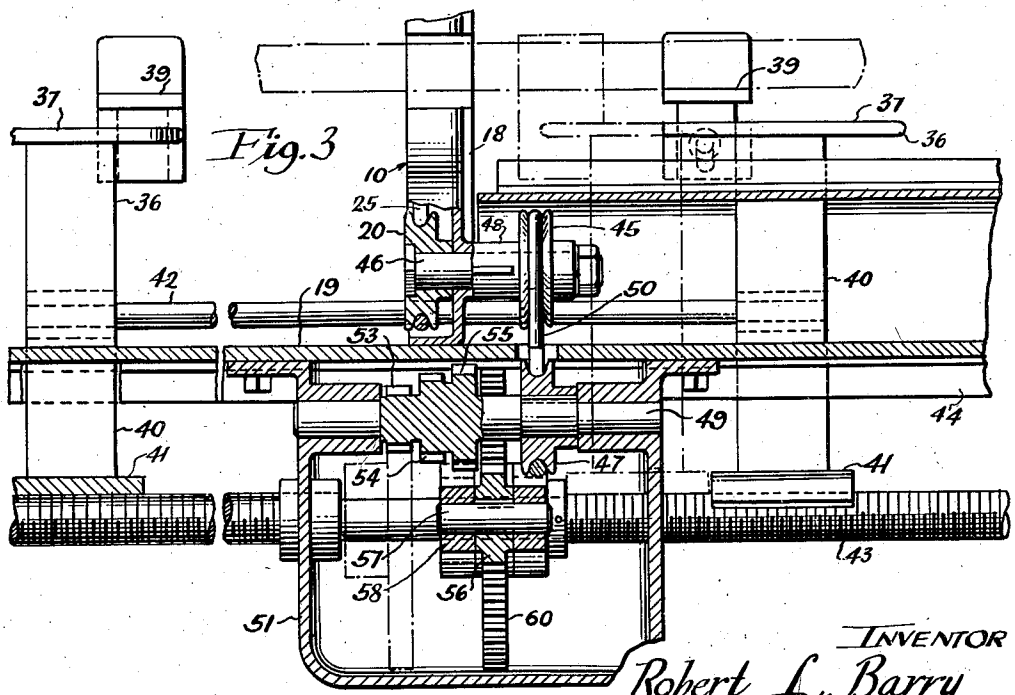


Fig. 3

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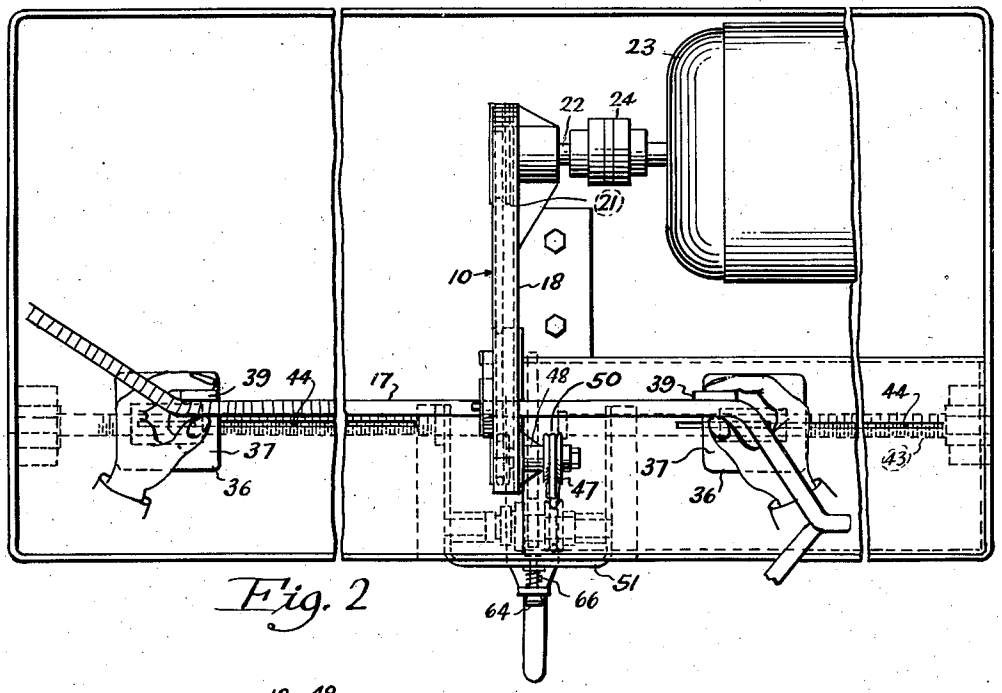


Fig. 2

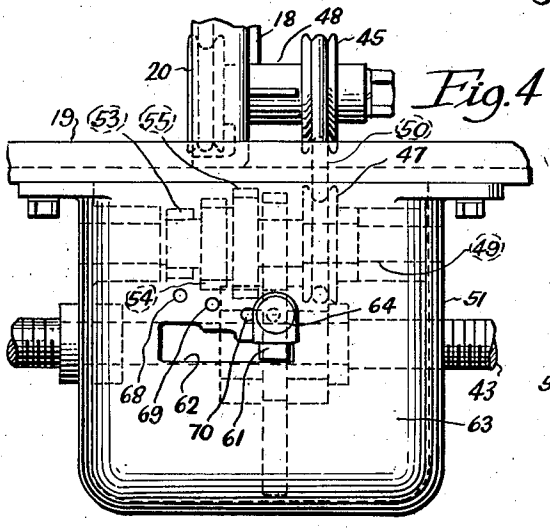


Fig. 4

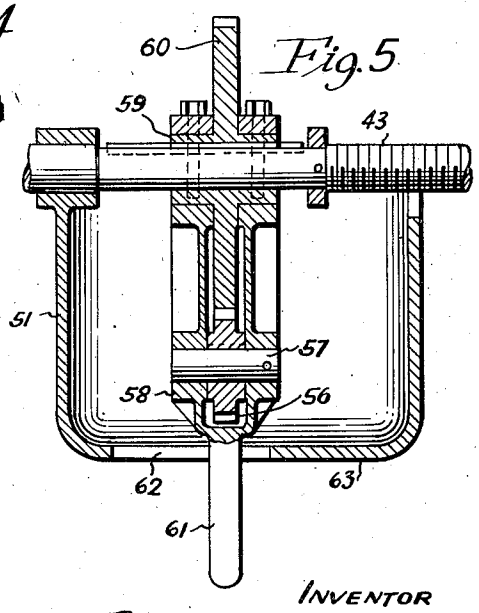


Fig. 5

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MEANS FOR TAPING ARMATURE COILS

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10 Claims. (Cl. 242—6)

This invention relates to improvements in means for taping armature coils and has as its principal objects to provide an improved armature coil taping means arranged to insure a predetermined uniform taping of the armature coil.

A more specific object of my invention is to provide a new and improved taping means for armature coils including a movable hand rest for the operator of the taping machine, so arranged that when the hand of the operator is rested on this hand rest, the hand and coil will be fed with respect to the shuttle for the taping means at a predetermined uniform speed; and the instant pressure is relieved from the hand rest, feeding of the coil and movement of the rest will stop.

Other objects of my invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is an end view of a taping device constructed in accordance with my invention;

Figure 2 is a fragmentary top plan view of the device shown in Figure 1, with a coil in position during the taping operation;

Figure 3 is a sectional view taken substantially along line 3—3 of Figure 1;

Figure 4 is an enlarged detail view showing certain details of the shifting mechanism for changing the speed of travel of the movable hand rests; and

Figure 5 is a fragmentary horizontal sectional view showing certain other details of the shifting mechanism not shown in Figure 4.

Referring now to the drawings, an armature coil taping device is indicated generally by reference character 10. Said taping device is mounted on a base or pedestal 11 so as to be at a height suitable for operation by a person in a sitting position.

The taping device 10 includes a rotatably driven shuttle 12 extending around and mounted in a grooved annular bearing 13. Said bearing is of a substantially C-shaped formation with an open portion 14, to permit an armature coil 17 to be inserted in the open center thereof. Said shuttle is likewise of a C-shaped formation and is provided with an open portion 15, to permit said armature coil to be inserted therethrough and through the open portion 14 in the open center of said shuttle when said open portions are in alignment with each other, so the coil may be moved along said shuttle in the direction of the axis of said shuttle.

The bearing 13 is mounted in a frame 18, which is mounted on the top of said pedestal on a plate 19. A pair of vertically spaced pulleys 20, 20a are disposed at the forward end of said frame, above and below the shuttle 12 and the open forward end of said frame. A drive pulley 21 is mounted at the opposite end of said frame on a horizontal shaft 22. Said shaft and pulley are driven from a motor 23, mounted on said plate, through a flexible coupling 24. The outer periphery of the shuttle 12 is grooved to receive a belt 25, driven from the drive pulley 21 and extending forwardly from said drive pulley around the pulleys 20, 20a and then rearwardly from said pulleys around the groove formed in the outer periphery of said shuttle to rotatably drive said shuttle and leave the open end thereof open in alignment with the open forward end of said frame, to receive an armature coil. A tension pulley 26, mounted on an adjustably movable arm 27, engages the outer side of the upper run of the belt 25, for maintaining said belt at the desired tension.

A spool or bobbin 29 is mounted on the shuttle 12 for rotation therewith on a pin 30. Said bobbin is adapted to pay off a tape 31, wound thereon. Said tape is threaded from said bobbin between a tension spring 32 and a tension plate 33, and inwardly from said tension plate to the armature coil, where it is wound thereon by rotation of said shuttle and bobbin with respect to the coil, in a direction which in Figure 1 is shown as being a clockwise direction. A shouldered guide 35 is provided in the central portion of the bearing 13 to form a guide for the armature coil 17, as it passes through the shuttle.

Referring now in particular to certain novel features of my invention and the means for insuring a predetermined uniform lap of the tape on the armature coil during the winding operation, a pair of spaced hand rests 36, 36 are provided. One of said hand rests is provided for each hand and said rests are disposed on opposite sides of the shuttle 12, one moving towards said shuttle and the other moving away from said shuttle during the winding operation. Each of said hand rests has a flat upper portion 37 to form a rest for the hand and has an upwardly spaced shouldered portion 39, against which the coil is held by the hand during the winding operation. The hand rests 36, 36, as herein shown, are each mounted on the upper end of a separate upright leg 40, which is mounted on and projects upwardly from an internally threaded sector of a sleeve 41, forming a partial nut engageable with the threads of a rotatably driven threaded shaft 43. Said legs extend through and

are guided in guides 44, 44 formed in the top plate 19 and extending along said plate in a direction parallel to the axis of rotation of the shuttle 12.

The partial nut 41 is herein shown as being substantially a third of a nut so that during rotation of the threaded shaft 43, when there is no weight on the hand rest 36, the threads of said sleeve will come out of mesh of the threads of said threaded shaft and said nut will remain stationary. When, however, the weight of the hand is placed on said hand rest, the threads of said nut will be engaged with the threads of said threaded shaft to cause said nut and hand rest to travel along said shaft, upon rotation thereof. Said hand rests may be connected in fixed spaced relation with respect to each other by means of a tie rod 42. Said tie rod may however be dispensed with where the lengths of the coils being taped differ, or where it is necessary to frequently adjust the spacing between the hand rests for different operators.

The drive from the motor 23 to the threaded shaft 43 includes a pulley 45 on an end of a shaft 46. Said shaft is journaled intermediate its ends in a bracket 48 projecting from the frame 18, and has the lower pulley 20 secured to its end opposite said pulley 45, which serves to drive said shaft and said pulley 45. The pulley 45 is connected with a pulley 47 on a parallel shaft 49 by means of a drive belt 50. Said parallel shaft is journaled at its ends in a gear housing 51, secured to the end of the plate 19 and forming a guard for change speed gearing for driving the threaded shaft 43 from the shaft 49 at a plurality of predetermined speeds.

Three gears 53, 54 and 55 are herein shown as being cut integral with the parallel shaft 49. Either one of said gears is adapted to mesh with a gear 56 journaled on a shaft 57, which is mounted at its ends in a yoke 58 journaled on a hub 59 of a spur gear 60, on opposite sides of said gear. Said last mentioned spur gear extends within said yoke and is feathered on the shaft 43 for movement therealong, and is also meshed with and driven from the spur gear 56, which is journaled in said yoke.

Rectilinear movement of the yoke 58 and spur gear 60 along the shaft 43 will thus position the spur gear 56 to mesh with either one of the spur gears 53, 54 or 55, so the threaded shaft 43 may be driven at a plurality of predetermined speeds. Said yoke and spur gear are moved along said shaft by means of a hand lever 61 extending outwardly therefrom through a slot 62 formed in an end wall 63 of said gear housing. The upper portion of said slot is of a stepped formation to permit said yoke to be moved to a position to mesh the gear 56 with either of the gears 53, 54 or 55, or to permit said gear 56 to be moved out of mesh from all of said gears.

The means for locking the gear 56 in mesh with either of the gears 53, 54 or 55 is herein shown as being a pin and aperture lock including a plunger 64 slidably mounted in an upwardly projecting bracket 65 of the hand lever 61. A spring 66 encircles said plunger and abuts the inner side of said bracket at one of its ends and a pin 67 at its opposite end. Said pin is mounted in and extends through the plunger 64, so that when it is engaged by said spring said plunger will be urged in a direction to engage either one of a plurality of apertures 68, 69 or 70, corresponding with the positions when said gear 56 is in mesh with either one of the gears 53, 54 or 55.

In operation of the machine, the gear 56 is meshed with either of the gears 53, 54 or 55, depending upon the desired lap of the tape. The armature coil is then inserted through the open portion of the frame 18 and the open portions 14 and 15 of the shuttle 12 and bearing 13 respectively. The vertical edge of said armature coil is then engaged with the shouldered guide 35 and the shouldered guides 39, 39, said coil then being in a position so that the portion to be taped extends in the direction of the axis of rotation of the shuttle. The motor 23 is then started, the hands holding the coil in engagement with the shouldered guides 39, 39 and resting on the hand rests 36, 36, to engage the sectors or partial nuts 41, 41 with the threads of the threaded shaft 43, so said shaft will move said hand rests with respect to said shuttle at a predetermined speed in the direction of the axis of rotation thereof.

Where it is desired that the leads or the legs of the coil be taped with a greater lap than the slot portions thereof, the speed of rotation of the threaded shaft 43 is changed by meshing the gear 56 with the desired gear 53, 54 or 55. It should here be understood that while only three gears are herein shown, any number of gears may be provided which may be meshed with the gear 56 to provide the required feed of the armature coil, to give the desired lap of the tape thereon.

When it is desired to tape the knuckle of the coil, the hands are removed from the hand rests to stop rectilinear movement thereof and the coil may be turned by hand to correspond to the intricate curve of the knuckle. When taping of the knuckle is completed, the hands may again be placed on said hand rests to tape the remainder of the coil with the desired lap.

While I have herein shown and described one form in which my invention may be embodied, it will be understood that the construction thereof and the arrangement of the various parts may be altered without departing from the spirit and scope thereof. Furthermore, I do not wish to be construed as limiting my invention to the specific embodiment illustrated, excepting as it may be limited in the appended claims.

I claim as my invention:

1. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle carrying the tape for wrapping the armature coil, tension means on said shuttle for maintaining the tape under tension while being wrapped around the armature coil, and a movable hand rest, moved by power at a predetermined speed, for feeding the armature coil along the axis of rotation of said shuttle to maintain a uniform and definite lap of the tape on said coil.

2. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle carrying the tape for wrapping the armature coil, tension means on said shuttle for maintaining the tape under tension while being wrapped around the armature coil, and means for feeding the armature coil along the axis of rotation of said shuttle, to main-

tain a uniform and definite lap of the tape on said coil including a hand rest moved by power in the direction of the axis of rotation of said coil at a uniform speed determined by the desired lap of the tape on the coil, and means for changing the speed of movement of said hand rest, to increase or decrease the amount of lap of the tape on the coil.

3. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle carrying the tape for wrapping the armature coil, tension means on said shuttle for maintaining the tape under tension while being wrapped around the armature coil, and means for feeding the armature coil along the axis of rotation of said shuttle to maintain a uniform and definite lap of the tape on said coil including a movable hand rest movable in the direction of the axis of rotation of said coil at a uniform speed determined by the desired lap of the tape on the coil, and manually operable change speed gearing for varying the speed of travel of said hand rest to vary the lap of the tape on said armature coil.

4. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle, tension means on said shuttle for maintaining the tape under tension while being wrapped around the armature coil, and means for feeding the armature coil along the axis of rotation of said shuttle at a uniform speed, to maintain a uniform and definite lap of the tape on said coil including a pair of hand rests movable in the direction of the axis of rotation of said coil, one of said hand rests being on each side of said bobbin to permit both hands to rest thereon and to hold and move the coil across said bobbin at a uniform rate.

5. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle, tension means on said shuttle for maintaining the tape under tension while being wrapped around the armature coil, and means for feeding the armature coil along the axis of rotation of said shuttle to maintain a uniform and definite lap of the tape on said coil including a pair of hand rests movable in the direction of the axis of rotation of said coil, one of said hand rests being on each side of said bobbin to permit both hands to rest thereon and to hold and move the coil across said bobbin at a uniform rate, and manually operable change speed means, for varying the speed of travel of said hand rests, to vary the lap of the tape on said armature coil.

6. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle, tension means on said shuttle for maintaining the tape under tension while being wrapped around the armature coil, and means for feeding the armature coil in the direction of the axis of rotation of said shuttle to maintain a uniform and definite lap of the tape on said coil including a threaded shaft extending parallel to the axis of rotation of said shuttle, means for rotatably driving said threaded shaft at a predetermined speed, and a hand rest rectilinearly moved by said threaded shaft upon the pressure of the hand on said hand rest.

7. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle, tension means on said shuttle for maintaining the tape under tension while being wrapped around the armature coil, and means for feeding the armature coil in the direction of the axis of rotation of said shuttle to maintain a uniform and definite lap of the tape on said coil including a threaded shaft extending parallel to the axis of rotation of said shuttle, means for rotatably driving said threaded shaft at a predetermined speed, a partial nut adapted to engage the threads of said threaded shaft, and a hand rest connected with said nut and so arranged that pressure of the hand thereon, when gripping the armature coil, will cause said nut to engage the threads of said shaft and be moved therealong.

8. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle, tension means for maintaining the tape under tension while being wrapped around the armature coil, and means for feeding the armature coil along the axis of rotation of said shuttle, to maintain a uniform and definite lap of the tape on said coil including a threaded shaft extending parallel to the axis of rotation of said shuttle, means for rotatably driving said threaded shaft at a predetermined speed, a pair of spaced hand rests, each of said hand rests being adapted to form a movable rest for the hand and an abutment against which the coil may be held by the hand during the taping operation, said hand rests being disposed on each side of said shuttle, and each of said hand rests being engaged with and rectilinearly moved by said threaded shaft upon the resting of the weight of the hands thereon.

9. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle, tension means for maintaining the tape under tension while being wrapped around the armature coil, and means for feeding the armature coil along the axis of rotation of said shuttle to maintain a uniform and definite lap of the tape on said coil including a threaded shaft extending parallel to the axis of rotation of said shuttle, means for rotatably driving said threaded shaft at a predetermined speed, a pair of partial nuts adapted to be engaged with the threads of said threaded shaft, one of said nuts being on each side of said

shuttle, and a hand rest extending upwardly from each of said nuts, said hand rests being so arranged that the pressure of the hands thereon when holding the armature coil will cause said nuts to engage the threads of said shaft to rectilinearly move said hand rests and armature coil with respect to said shuttle at a predetermined speed.

10. In a taping machine for armature coils, a frame, a shuttle rotatably mounted on said frame, said shuttle having an open portion to permit an armature coil to be inserted therein and to be moved with respect thereto in the direction of the axis of rotation of said shuttle, a bobbin on said shuttle, tension means for maintaining the tape under tension while being wrapped around the armature coil, and means for feeding the armature coil along the axis of rotation of said shuttle to maintain a uniform and definite lap of the tape on said coil including a threaded shaft extending parallel to the axis of rotation of said shuttle, means for rotatably driving said threaded shaft at a predetermined speed, a pair of partial nuts adapted to be engaged with the threads of said threaded shaft, one of said nuts being on each side of said shuttle, and a hand rest extending upwardly from each of said nuts, said hand rests being so arranged that the pressure of the hands thereon when holding the armature coil will cause said nuts to engage the threads of said shaft, to rectilinearly move said hand rests and armature coil with respect to said shuttle at a predetermined speed, and change speed gearing for varying the speed of rotation of said threaded shaft to vary the lap of the tape on the armature coil at various points therealong.

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